

**REMARKS/ARGUMENTS**

Reconsideration and continued examination of the above-identified application are respectfully requested.

In the amendment to the specification, paragraph [0059] has been amended to refer to Fig. 2 which is a master curve showing the general correlation of work of cohesion minus work of adhesion and yield point as indicated in paragraph [0017] of the present application. The spelling correction in paragraph [0063] has been made.

With respect to the Figures, with this response are two proposed drawing corrections to Figs. 1 and 3 as requested by the Examiner. It is respectfully submitted that no new matter is being introduced by any of these amendments. Accordingly, entry of these amendments is respectfully requested.

At page 2 of the Office Action, the Examiner objects to Figs. 1 and 3. In response, the applicants have provided proposed drawing corrections with this response. The Examiner is respectfully requested to approve these changes and to replace original Figures 1 and 3 with the attached figures.

Also, at page 2 of the Office Action, the Examiner objected to the specification at page 18 and 20.

In response, the appropriate correction has been made to these two paragraphs. As indicated above, Fig. 2 is described in paragraph [0017] as providing a master curve showing the general correlation of the work of cohesion minus work of adhesion and yield point which is being referred to at paragraph [0059]. Accordingly, entry of this amendment is respectfully requested and the objection should be withdrawn.

At the bottom of page 2 of the Office Action, the Examiner rejects claims 1-11 under 35 U.S.C. § 112, second paragraph as being indefinite. The Examiner asserts that the preamble describes a method for determining a rheological master curve but that step e) does not recite the curve being produced after the correlating step. Furthermore, the Examiner asserts that the claim does not indicate "curve" parameters or identify the independent and dependent variables. The Examiner indicates that the same rejection is also made for independent claim 5. For the following reasons, this rejection is respectfully traversed.

With respect to claim 1, claim 1 recites a method for determining a rheological master curve for a composition comprising a filler in a matrix. Steps a)-e) are recited in claim 1. The applicants respectfully note that claim 1 recites a method for determining a rheological master curve and does not relate to plotting a master curve or actually forming a master curve. Claim 1 clearly recites that it relates to a method for determining a rheological master curve and therefore there is no need or necessity to recite that a rheological master curve is formed at the end of step e). 35 U.S.C. § 112, second paragraph recites that one or more claims shall be particularly pointed out and distinctly claimed. The standard for § 112, second paragraph requires that one skilled in the art reading the claims would understand the breath and scope of the claim. This is clearly the situation with respect to claims 1 and 5 and the claims dependent thereon. The five steps recited in claim 1 are clearly understood by one skilled in the art and this information is sufficient for one to determine a rheological master curve for a composition. Similarly, claim 5 recites a rheological master curve and describes that the master curve correlates the difference between the work of cohesion of the filler and the work of adhesion of the matrix to the filler and a rheological property of the composition. Again, the scope provided by this claim would clearly be understood by one skilled in the art. Further, claim 5 actually claims the rheological master curve and therefore a recitation of

forming a rheological master curve would not be appropriate for claim 5.

With respect to the Examiner's assertions that various variables should be identified in the claims, the applicants respectfully disagree. Again, § 112, second paragraph, requires that the claims be clear as written to one skilled in the art so that one skilled in the art can understand the breath and scope of the claim. Again, this is the case. The five steps recited in claim 1 can clearly be understood and determined, especially in view of the present application. From this information, one skilled in the art can clearly determine the rheological master curve for a composition comprising a filler and a matrix. Thus, under § 112, second paragraph, this claim would clearly be understood by one skilled in the art and the scope and breath of this claim would be understood. As stated above, each of these steps are described in the present application and examples are given. Accordingly, this claim, as well as the remaining claims including claim 5 would clearly be understood by one skilled in the art, including the metes and bounds of the claims. For these reasons, the rejection should be withdrawn.

At page 3 of the Office Action, the Examiner rejects claims 1-11 under 35 U.S.C. § 103(a) as being unpatentable over "Adhesion and Components of Solid Surface Energies" by John H. Clint, published in *Current Opinion in Colloid & Interface Science* 6, pp. 28-33 (2001) and "A Novel Method for Surface Free-Energy Determination of Powdered Solids" by Emil Chibowski et al., published in *Journal of Colloid and Interface Science* 240, 473-479 (2001). The Examiner asserts that Clint relates to a method for determining a rheological master curve of a filler in a matrix composition and refers to Fig. 1. The Examiner does indicate that Clint does not expressly disclose the determination of work of cohesion of the filler and the subsequent difference between cohesion and adhesion and correlating the result. The Examiner then relies on Chibowski et al. to assert that the determination of surface energies, contact angles, work of adhesion, work of cohesion

for a filler, and the difference between the two forming functional relationships are shown in Chibowski et al. Thus, the Examiner concludes that it would be obvious to one having ordinary skill in the art to employ the method steps of Chibowski et al. in Clint. For the following reasons, this rejection is respectfully traversed.

Claim 1 of the present application recites a method for determining a rheological master curve for a composition comprising a filler in a matrix. With respect to some of the steps set forth in claim 1, it is important to recognize that the determination of the work of adhesion is with respect to the work of adhesion of the matrix to the filler. Furthermore, the work of cohesion is with respect to the work of cohesion of the filler.

The Examiner asserts that John H. Clint, as published in *Current Opinion in Colloid & Interface Science*, 6, pp. 28-33 (2001), does not expressly disclose the determination of the work of cohesion,  $W_c$ , of the filler, the subsequent determination of the difference between the work of cohesion and adhesion ( $W_c - W_a$ ), and correlating the result (i.e. forming a functional relationship) to a rheological property to form the rheological curve.

The Examiner also states that Chibowski et al., as published in *Journal of Colloid and Interface Science* 240, 473-479 (2001), shows the determination of surface energies, contact angles for at least three probe liquids, work of adhesion  $W_a$  (eqn 5), and work of cohesion  $W_c$  for a filler and the difference between the two forming functional relationships based on the difference of the works of adhesion and cohesion (eqns 13-16).

However, this is a misreading of the meanings of  $W_a$  and  $W_c$  as defined by Chibowski et al.

From Chibowski et al., (p. 475, first column) the formula is:

$$\gamma_{sf} = \gamma_s - \pi = \gamma_s - W_s = \gamma_s - (W_a - W_c) \quad [13]$$

where  $W_s$  is the work of the liquid spreading,  $W_a$  is the work of the liquid adhesion, and  $W_c$  is its work of cohesion. The antecedent of the possessive, its, is the liquid, not the solid (or filler).  $W_c$  is therefore the work of cohesion of the liquid, not the solid (or filler). The parenthetical term in Eqn [13] is not the difference between the work of adhesion and the work of cohesion of the solid (e.g., filler) as described in the claimed invention. They are completely independent quantities. The work of cohesion of the liquid is a term common in the literature and is equal to twice the liquid surface tension.

Also, to further show that the  $W_c$  in Chibowski et al. is not the work of cohesion of the solid, the text above Equation [13] states: "where the subscript sf stands for the solid surface covered with the spreading film (duplex)." The surface energy of the solid is the leading term,  $\gamma_s$ , on the right hand side of all three equations in [13]. One skilled in the art would clearly understand that  $W_c$  in Chibowski et al. is not the work of cohesion of the solid (or filler).

Furthermore, the paper by Chibowski et al. makes no mention of, nor any reference to, a method to determine  $W_c$ , nor any example of its use, nor any report of its value for the materials tested. Moreover, no methods to actually determine a rheological master curve as recited in the claims is taught or suggested in any of the cited references.

Accordingly, for the reasons set forth above, even if Chibowski was somehow combinable with Clint, the combination still would not teach or suggest the claimed invention. Furthermore, with regard to many of the Examiner's comments for the dependent claims, the applicants respectfully disagree. The Examiner, without support in any of the cited references, concludes that it is within the skill of the art to perform several of the recited steps set forth in the dependent claims. However, without any evidence in the actual cited art that these steps would be obvious to one skilled in the art, a *prima facie* case of obviousness has not been established for this reason as well.

U.S. Patent Application No. 10/649,348  
Amendment dated October 29, 2004  
Reply to Office Action of April 29, 2004


Accordingly, for the reasons set forth above, this rejection should be withdrawn.

## **CONCLUSION**

In view of the foregoing remarks, the applicant respectfully requests the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,

  
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**Amendments to the Drawings:**

The attached sheets of drawings include changes to Figs. 1 and 3. The sheet, which includes Fig. 1, replaces the original sheet including Fig. 1. The sheet, which includes Fig. 3, replaces the original sheet including Fig. 3.

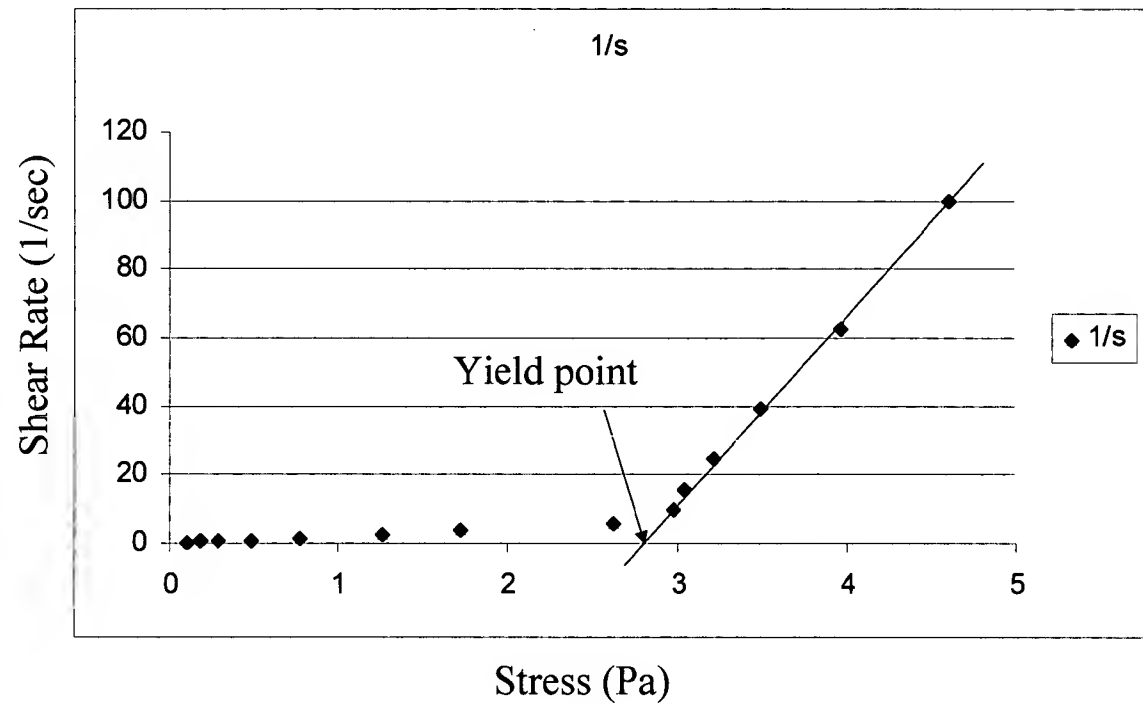
Attachment: Replacement Sheets

Annotated Sheets Showing Changes



Application No. 10/649,348  
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Annotated Sheet Showing Changes

FIG. 1



gray background removed

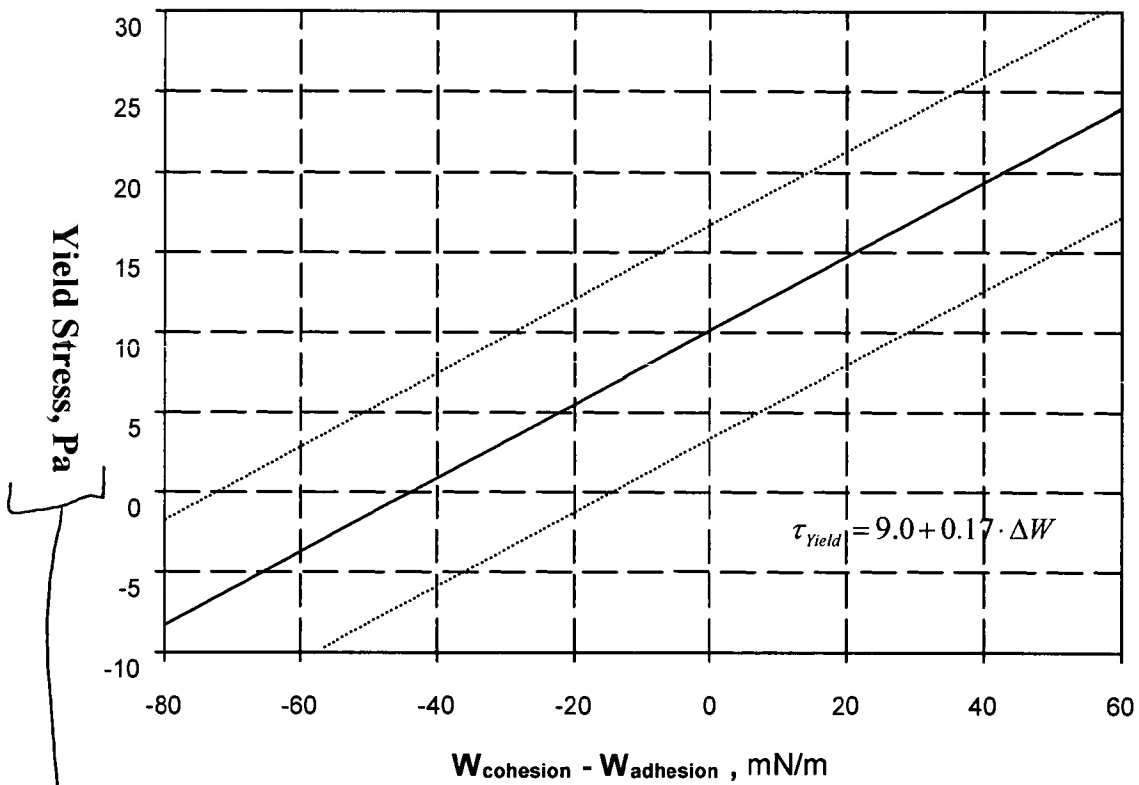




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Annotated Sheet Showing Changes

FIG. 3

**Yield Stress versus Delta Work**



rearranged